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# MAINE AGRICULTURAL EXPERIMENT STATION.

## BULLETIN No. 26.

### INSPECTION OF GLASSWARE USED BY CREAMERIES AND BUTTER FACTORIES TO DETERMINE THE VALUE OF CREAM AND MILK.

J. M. BARTLETT.

Ever since the introduction of the Babcock test for estimating the value of cream or milk at creameries and butter factories, more or less dissatisfaction and in some cases distrust, have prevailed among a few patrons to whom payment has been made on this basis. These complaints have come in various forms. Some creameries have been accused of using incorrectly graduated glassware, pipettes that were too small, thereby making the test too low; others of employing incompetent men to manipulate the test.

In order to remedy such evils if they existed and restore confidence to the minds of the patrons, a law was enacted by the Maine Legislature of 1895, entitled "An act for the Protection of Dairymen," which appears as Chap. 169 of the laws of 1895. Without giving the full text of this law, there is stated below a summary of its principal provisions and requirements.

SECTION 1. This section requires that every individual or corporation buying milk or cream or apportioning its value on the basis of the fat content shall have all the bottles and pipettes tested for accuracy, which are used in determining the per cent. of fat, and each of these bottles and pipettes shall bear a mark showing that it has been so tested.

SEC. 2. In this section it is made the duty of the Director of the Maine Experiment Station or some person he may designate, to execute the provisions of Section 1. The actual expense of this work shall be paid by the persons or corporations for whom it is done.

SEC. 3. This section requires that any person operating the Babcock or other tests for determining the fat in milk or cream which is to be purchased or its value apportioned, must possess a certificate of competency for such work. This certificate is to be issued by the Superintendent of the State College Dairy School in accordance with such rules and regulations as he may devise.

SEC. 4. No one is allowed to use at any creamery, butter factory, cheese factory or condensed milk factory where milk or cream is bought or its value apportioned, or to have in his possession with intent to use, any sulphuric acid of less than one and eighty-two hundredths specific gravity. This section also provides penalties for the violation of the provisions of this act.

SEC. 5. This section fixed the date on which this law shall take effect which is six months from the day of approval, or September 27, 1895.

Early in the spring of 1895 a circular letter was sent to each creamery with which was enclosed a copy of the law giving notice that the Station would be ready to test all glassware after June 1. The examination of candidates and issuing of certificates of competency for making the test was conducted by Professor G. M. Gowell, superintendent of the dairy school, and the work of testing the glassware was delegated to the writer.

#### METHOD OF MAKING THE TEST.

For this purpose we had made an accurately graduated burette of the same diameter and marked the same as the necks of the cream bottles. The bottle to be tested is filled to the zero mark with mercury as is also the burette. Then the mercury is allowed to run slowly from the burette into the bottle until the upper line of the mercury stands at the 5 per cent. mark on the burette. The mark at which the upper line of the mercury stands in the neck of the bottle is also noted and if it coincides with the 5 per cent. mark, the graduation is correct. Another portion is now run in until the 10 per cent. mark on the burette is reached and so on until the 25 per cent. mark is reached. Slight errors like one or two-tenths of 1 per cent. have been passed unnoticed, but when there was an error of three-tenths or more, the bottles have been thrown out, not because three-tenths in practice is a serious error, but because it is better to insist that manufacturers shall furnish goods up to their guarantee.

For testing pipettes, an accurately graduated standard pipette is used. It is filled with mercury and then the contents is emptied into the pipette to be tested. If the point reached by the mercury coincides with the mark on the standard pipette, it is of course correct. All bottles and pipettes tested and found correct have been marked with the letters O. K., while those that are not correct are marked "off."

Only about one-half of the creameries of the State have sent their glassware to us, which indicates one of three things: (1) That those who have not responded are not using the test; (2) that they have obtained tested glassware from dealers, or (3) they have not complied with the law. In all, 1,498 cream bottles, 210 milk bottles and 96 pipettes were received prior to January 1st. Thirty-nine of the cream bottles were found to be more inaccurate than the prescribed limit, three-tenths of one per cent. and were consequently thrown out. Twenty-four of the number, however, were found in two small lots which evidently came from some unreliable manufacturer, as the error found was greater in those, in some cases over one-half of one per cent., than in any other lots. Of the 210 milk bottles all were correct, excepting 33 of one lot of 60. The errors in these bottles varied from three-tenths to one per cent. The source of these bottles could not be learned as they were found at the creamery when the parties now occupying it took possession. They were evidently made by some unreliable firm.

The glassware as a whole, however, has been very satisfactory and the new goods received from the manufacturers since the above act went into force have been exceptionally accurate, showing that the law has had the desired effect. No intentional fraud has been detected, the discrepancies discovered evidently being due to errors in graduating.

The law, although in most cases seeming unnecessary, cannot help being beneficial to all parties using the test, as it will eventually exclude the goods of unreliable manufacturers from the State, and will tend to increase confidence in the accuracy of the method upon which are based the payments for milk and cream.

The following is a list of the parties and creameries who have sent us their glassware to be tested:

E. E. Light, Union, Me.

West Paris Creamery, West Paris, Me.

Bethel Dairy, Bethel, Me.

Bridgton Creamery, Bridgton, Me.  
W. L. Phillips, East Wilton, Me.  
Forest City Creamery, Portland, Me.  
Hillside Creamery, Exeter, Me.  
A. L. & E. F. Goss Co., Lewiston, Me.  
Turner Centre Creamery, Auburn, Me.  
New Gloucester Creamery, New Gloucester, Me.  
Wonder Brook Creamery, Kennebunk, Me.  
John C. Gordon, Ellsworth, Me.  
G. F. Gerry, Garland, Me.  
Solon Creamery, Solon, Me.  
Poland Dairy Association, Poland, Me.  
I. O. Winslow, St. Albans, Me.  
C. A. Whitney, Norridgewock, Me.  
Bangor Creamery, Bangor, Me.  
C. C. Nichols, Foxcroft, Me.  
E. S. Dixon, Sabbathus, Me.  
J. M. Tukey, New Castle, Me.  
——— Smith, Hampden, Me.  
E. Pittston Creamery, East Pittston, Me.

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